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THIRTY YEARS WITH PHEASANTS

by Philip Schofield

Most of us who keep birds, do so for the pleasure of having them around. Looking through recent issues of the magazine one notices there are few articles that refer directly to this aspect of aviculture, the emphasis is rather on species that for reason of cost, low availability or absolute rarity, are not present in most small collections. Having enjoyed keeping pheasants for some 30 years, it seems appropriate to address this imbalance and share some of my experiences of this group of birds which combine relative ease of culture with spectacular beauty and low cost of purchase. The most expensive birds in my collection have been Germain's Peacock Pheasants *Polyplectron germaini*, endangered in the wild, yet still selling for less than the commonest Amazon parrot *Amazona* spp. Pheasants provide an opportunity for the small scale hobby aviculturist to study the behaviour of rare species and contribute to their survival.

As a small boy visiting a country house and gardens one Sunday afternoon when they were open for a charity event, I saw my first Golden Pheasant *Chrysolophus pictus*. An adult male in glorious colour, it was sharing an aviary with a collection of small birds. Although interested in birds from an early age, I have no recollection of what the other birds in the aviary were, such was the impact of the Golden Pheasant. I kept returning to the aviary to look at it, poking bits of grass through the wire as children will, and was reluctant to leave with my parents at the end of the afternoon. To my already firm ambition to have my own aviary was added the condition that it had to have Golden Pheasants in it. Other childhood memories include Silver Pheasants *Lophura nycthemera* sharing an aviary with Demoiselle Cranes *Anthropoides virgo* at Colchester Zoo in the early 1960s, and the Pheasant Lawn at the Norfolk Wildlife Park, where a large number of male pheasants of several species lived in a walk-through paddock. The latter still seems a good way to display pheasants to the public and could well be more generally adopted. At the age of 15, in the spring of 1969, I was offered a male

Golden x Lady Amherst's Pheasant *C. pictus* x *C. amherstiae*, that had been found in somebody's garden. Purchased for 15 shillings (75 pence or less than 50¢ US), my first pheasant settled happily in an aviary with a few pigeons, proving a trouble-free and attractive pet, harmless to his aviary companions. Soon afterwards, I purchased a few pure-bred eggs of both Golden and Lady Amherst's Pheasants, of which my bantams reared two and five young respectively.

In 30 years with pheasants, 17 species have lived for varying periods in my small collection. I was also fortunate to be employed for a few months at a collection that held almost all the pheasant species, providing daily contact with some that I would otherwise never have got to know on a 'personal' level. A summer in Pakistan with the World Pheasant Association gave me some experience of the problems of reintroduction, and some knowledge of pheasant habitat, although I failed to see a single wild pheasant in the three months I was there. Those that have bred repeatedly in my aviaries are the Golden, Lady Amherst's, Cheer *Catreus wallichii*, Reeves' *Syrmaticus reevesii*, Nepal Kalij *Lophura leucomelana leucomelana,* Silver, Grey Peacock Pheasant *P. bicalcaratum*, Germain's Peacock Pheasant and the melanistic form of the Common Pheasant *Phasianus colchicus*. Edwards' *L. edwardsi*, Swinhoe's *L. swinhoei*, Red Junglefowl *Gallus gallus* and Ceylon Junglefowl *G. lafayetti* have all bred once. Blue Peafowl *Pavo cristatus*, Himalayan Monal *Lophophorus impeyanus* and Elliot's *S. elliotti* have so far produced only infertile eggs. Japanese Green Pheasants *P. versicolor* were reared from eggs laid elsewhere.

My pheasants have lived in a variety of settings. The Ceylon Junglefowl occupied an aviary 13ft X 4ft x 6ft high (approx. 3.9m x 1.2m x 1.8m high), built in the angle of two brick walls and completely enclosed by polythene sheeting. Electric tubular heaters thermostatically controlled to 40°F (4.4°C) were placed beneath two 1in (2.5cm) diameter dowel perches. These were intended to prevent them getting frostbitten feet, as this species is not completely hardy. Smaller diameter natural perches were placed higher in the aviary for the other occupants, which at various times included Green-winged Doves *Chalcophaps indica*, Ruddy Ground Doves *Columbina talpacoti*, Chestnut-flanked White-eyes *Zosterops erythropleura*, Pekin Robins *Leiothrix lutea*, Spice Birds *Lonchura punctulata* and New Colour Canaries (dom.). Of these, the canaries and ground doves bred repeatedly, and the Pekin Robins got as far as a completed nest. The aviary floor was covered with several inches (centimetres) of peat, and conifer branches in a corner sheltered a possible nesting area for the junglefowl. No living vegetation was included. This was in the early 1970s. Were I to use such a small aviary for a pair of pheasants now, I would keep at most only two other pairs of birds with them, and make an effort to provide appropriate

planting. However, this aviary functioned successfully for three years and in it I achieved what set out to do, which was to breed Ceylon Junglefowl.

My Red Junglefowl bred under very different conditions. The pair were turned out, wing-clipped, in an open-topped enclosure approximately 100ft sq (30.48 m sq), heavily planted and containing a concrete pond. Already in residence were Demoiselle Cranes and various ducks and geese. The Golden Pheasants had been removed as the male fought with the male junglefowl. Both junglefowl roosted in the shrubs at night, sometimes coming down on the wrong side of the fence in the morning, and having to be walked back in through the gate. This proved the male's undoing, as one morning a passing fox found him before I did. By this time the female was incubating, and she reared her brood with minimal help.

My Germain's Peacock Pheasants were provided with enclosed shelters and heated perches. The latter involved greenhouse heated tape, thermostatically controlled to 40°F (4.4°C), laid in a groove along the upper surface of the roosting perch to prevent frostbitten toes. The supposedly hardier Grey Peacock Pheasants had enclosed shelters without heating. Great efforts were made initially to induce both species to roost indoors during the winter. In later years, feeling that their delicacy was rather exaggerated, I allowed them to sleep where they liked, with no ill effects, and less stress to all concerned.

Most of my pheasants have been housed in conventional aviaries ranging from 10ft x 6ft (approx. 3m x 1.8m) to 40ft x 15ft (approx. 12.1m x 4.5m) in size, with partial overhead protection. Here again there have been developments over the years. Early aviaries had 2in (5cm) mesh wire netting. This reduced the number of other species that could be kept with the pheasants and enabled wild birds to enter and eat the food. For some years now all my aviaries have been covered with ½in (1.3cm) mesh, which also effectively retains any pheasant chicks being reared by their parents. I once built a range of aviaries 5ft (approx. 1.5m) high, intended to house only pheasants. While fine for the birds, this arrangement was very uncomfortable for me - at nearly 6ft (approx. 1.8m) and with a back problem - and has not been repeated.

Various materials have over the years formed aviary floors here. Grass has survived with peacock pheasants. All the others have trampled it, eaten it or dug it up. This applies as much to ornamentals such as Pampas Grass *Cortaderia selloana*, as it does to any attempt at a lawn. Peat is successful and hygienic in small covered aviaries, and can be recycled as garden compost. More environmentally acceptable is shredded bark, but it tends to go mouldy and become a health hazard when used under cover. Used in the open, it looks good, stays fresh and is comfortable for the birds' feet. Therefore, I prefer to use bark in the open flight and wood shavings in the

shelter. Gravel (except for expensive pea gravel) and sharp sand can be very uncomfortable for the birds' feet and soft sand can become muddy. An earth floor can work successfully if the drainage is good and the aviary is large enough. Mud is bad for the birds' health and ruins their tails.

My existing aviaries are heavily planted with shrubs. The most resilient of these is Japanese Honeysuckle *Lonicera nitida*, superficially similar to Box *Buxus sempervirens* but much quicker growing. It seems unpalatable to the most voracious browsers and will grow in any soil. Its only disadvantage is that occasionally one of the bird's long tail feathers will become entangled in it, resulting sometimes in the feather being pulled out and the bird having to grow a new one. An evergreen, its dense foliage provides shelter and nest sites for both large and small birds. It can be trained to any shape, and will grow sufficiently low to the ground to provide nest sites for pheasants. Box has most of the same characteristics, but is so slow growing that it is much less useful in an aviary. Buddleia species of various colours are attractive when in flower and are very tolerant of pruning. The same applies to Hawthorn *Crataegus* spp. which does not seem to be eaten by pheasants. Almost any conifer will adapt to an aviary situation and most can be 'topped' when they reach the roof netting. The same treatment can work with deciduous trees. I have Sycamore *Acer pseudoplatanus* and Elder *Sambucus nigra* well established in aviaries. Sycamore does not appear to be eaten, while the apparently more palatable Elder is quick growing enough to withstand considerable browsing pressure. Snowberry *Symphiorcarpus* spreads quickly if a large enough clump is planted to withstand the initial onslaught of hungry pheasants, and most species enjoy eating its berries. The same applies to the various cultivated currants *Ribes* spp. Peacock pheasant look wonderful against a background of bamboo, of which many are available, ranging from those suitable as ground cover to the 18ft (approx. 5.4m) high Black *Phyllostachys nigra*. Points to consider when planting an aviary for pheasants are:

1. While all pheasants will eat vegetation, peacock pheasants hardly ever do so, whereas Golden Pheasants pursue a 'scorched earth' policy and eat anything within reach which is remotely palatable. Most species will by digging expose the roots of plants, with peacock pheasants again being relatively innocent and monals being by far the worst offenders.

2. Ideally plants should be left to become well established before pheasants are introduced into an aviary. New shrubs added later to an already stocked aviary should be as large as possible to maximise their chances of survival.

3. Ideally the distance between any plant and the side of the enclosure should be not less than the length of the pheasant's tail. This will reduce the incidence of broken tail feathers as birds walk up and down alongside the

wire. Roles (1976) gives suggestions for a variety of planting schemes, some to provide particular colour contrasts, and some to match pheasant species with plants they would encounter in the wild.

Most of the pheasants listed will sleep outside, perched as high as possible. If they get rained on overnight, they will retire under cover in the morning to preen and dry off. Monals and Cheer will sometimes sleep on the ground by choice; the others rarely do so. Germain's Peacock Pheasant and Ceylon Junglefowl need mild heating to protect their toes from frostbite; Grey Peacock Pheasants seem happy with just protection from wind and rain at least this is the case here in Dorset, in southern England. Whatever Blue Peafowl may endure, when living at liberty, I have had well-grown young birds contact pneumonia and die through sleeping out in the rain, and as a result have trained mine to sleep in a dry shed. All the above species but for the exceptions mentioned, seem indifferent to cold weather.

Aviary companions for pheasants should be selected to suit the species and space available. One needs to consider that smaller birds' food is likely to be attractive to pheasants and may need to be protected from them, or provided in sufficient quantities to satisfy both. Roosting and nesting facilities may also need to be protected. The dangers to other species from pheasants take two forms:

1. Predation. Large pheasants (Cheer, Silver and peafowl are particular offenders) may regard small birds as acceptable livefood and eat those they can catch. To prevent this happening to fledglings they can be caught and caged within the aviary until they can fly well. I have, before they were due to fledge, placed young canaries, Java Sparrows *Padda oryzivora* and Himalayan Goldfinches *Carduelis carduelis caniceps* in a small all-wire cage and the parents have fed them through the wire until it was safe to let them out. For this to work, the cage must be a little bigger than the nest. I use a Spanish call-bird cage.

2. Aggression. This is likely to be directed at ground dwelling/large species. I have had an otherwise benign male Golden Pheasant kill a Wood Pigeon *Columba palumbus* in the breeding season, and a pair of Cheer Pheasants that did the same when they had chicks to defend. When I attempted to introduce a Ringed Plover *Charadrius hiaticula* in to an aviary in which an unmated Germain's Peacock Pheasant was sitting on eggs, she came off the nest to attack the plover and it had to be rescued. My pair of Monals, when released in the waterfowl enclosure, ignored the waterfowl, but unmercifully persecuted the Demoiselle Cranes and could not be left with them. In the same enclosure, Golden Pheasants were a great success, as were unmated Cheer and juvenile Swinhoe's Pheasants at different times. As a general rule, I consider *Polyplectron* and *Chrysolophus* spp. safe in

mixed aviaries, while all the others need to be subject to careful introductory trials. No pheasant is immune to the gastronomic temptation of a nest of small birds' eggs. While Old World quail may coexist with pheasants, the American species can be a problem. When I attempted to introduce an odd male Gambel's Quail *Lophortyx gambellii* in to a small enclosure occupied by an unmated female Kalij, he quickly confined her to a corner from which she was afraid to move, and so they had to be separated. California *L. californicus* and Bobwhite Quail *Colinus virginianus* at different times proved equally dangerous to pheasants.

Although some of the literature suggests that distantly related pheasant species can be kept together, my limited experience does not confirm this. A male Grey Peacock Pheasant for many months tolerated juvenile peafowl, but later when I tried to introduce him to a sub-adult pair housed in a 40ft (approx. 12m) aviary, he proceeded to harrass them until they turned on him and he had to be rescued. The same pair of peafowl, now adult, currently tolerate juvenile Golden Pheasants, but will not accept an adult male. As I mentioned earlier, my Red Junglefowl would not agree with my Golden Pheasants. Equally, I find male Golden Pheasants will eventually pick a fight with bantams, even after months of peaceful coexistence. A friend has two male Old English Game Bantams confined with a year old pair of Golden Pheasants, and the two chicks reared that year proved to be hybrids.

Thanks to foods developed for the poultry industry, a basic diet for pheasants is easily provided. Layers' or breeders' pellets (chick crumbs during the first weeks of life) can be provided ad. lib., together with small quantities of wheat fed to them by hand once a day, or scattered in the aviary to give the birds something to look for. Most species appreciate hard-boiled egg, fresh and dried fruit, greenfood, peanuts, small seeds, livefood (mealworms are especially acceptable and convenient) and wholemeal bread. None of these are essential for the species described, but their provision improves the quality of life for the birds and provides a chance for the keeper to build up a relationship with them. Appropriate grades of shell and flint grit are essential. A multivitamin powder sprinkled on the food may improve breeding and rearing prospects, while proprietary pigeon minerals can be provided to the same end.

When I had Golden Pheasants at liberty in the waterfowl enclosure, it was surprising how high they could scramble up into the trees at night. Heavily wing-clipped individuals would attain heights of 20ft-30ft (approx. 6m-9m) in Horse Chestnut *Aesculus hippocastaneum* and Beech *Fagus sylvatica* to roost, and always descended safely in the morning.

Of the species kept, Golden, Lady Amherst, Kalij, Cheer, Red Junglefowl, Germain's and Grey Peacock Pheasants all reared their own young. The male Lady Amherst ignored his offspring while the males of all the other

species were seen to associate with their broods. Cheer and *Polyplectron* males would call the female and chicks to feed, and would perch at night with well-grown young under a protective wing. When a female Golden Pheasant left her tiny chicks on the ground unable to follow her to her high roosting place, the male flew down and brooded them. This happened every evening until they were able to fly up to roost. A female Reeves' hatched chicks which were promptly killed by the male. The birds were in a 10ft (approx. 3m) square aviary, and this may have been heightened aggression as I have heard of Reeves' in larger quarters being excellent fathers. Another infanticide was by a female Kalij, which killed the only female in a brood of four when they were half grown; here again it was probably caused by their close confinement. The same bird performed what appeared to be a distraction display in which she fell forward and trembled her shoulders when I entered the aviary where she had chicks. A female Monal sat well beyond her time on infertile eggs. None of the other species showed any desire to sit, and their eggs were hatched by bantams or in incubators. The female Ceylon Junglefowl was an inveterate egg-eater to the extent that I had to be on hand to retrieve her eggs as they were laid.

There was regularly fighting between the male and female of a potential breeding pair of Monals. In a 30ft (approx. 9m) aviary over a number of years, the male would be dominant through the breeding season, but as soon as he started to moult, the female would turn on him and at times they had to be separated. Although no damage was done, the persistent chasing of one by the other led me to take no chances. Tiring of large numbers of infertile eggs and failing to integrate them with the waterfowl, I eventually sold them. The following year the new owner got one fertile egg out of the twenty-five laid and from it reared a fine male, after which they reverted to 100% infertility for as long as they lived. Both species of *Polyplectron* caused trouble when forming new pairs, either sex could scalp the other, and introductions had to be carefully managed. Most species were kept in pairs when breeding except Golden Pheasants and Kalij, both of which laid quantities of fertile eggs when kept in trios consisting of a male and two females. Another exception was Grey Peacock Pheasants which bred one year with two females in adjoining aviaries, sharing a male on alternate days. These two females made it abundantly clear that they would kill each other if they ever got together. Early attempts to keep a quartet of Lady Amherst Pheasants in a small aviary were frustrated when one of the females became dominant and persecuted the others. It was also necessary to be careful when introducing a young male to an established adult female, as he could be attacked. Two pairs of melanistic Common Pheasants bred happily as a group one season in a waterfowl enclosure some 50ft (approx. 15m) square. These were four siblings that had never been apart and the males

showed no aggression towards each other. Commercial game pheasants are commonly flock mated, but with far more males and females in each group.

With patience and the use of tit-bits most pheasants will become hand tame. However, a male that has become completely unafraid of people is likely to regard them as rivals in the breeding season. This seems normal with Ceylon Junglefowl and Silver Pheasants. The latter have enough weight and spurs to be dangerous, and a dustbin lid makes a good shield when working in their aviaries. Even a male Germain's Peacock Pheasant in a local tropical house had to be removed when he started attacking members of the public. Females will sometimes attack in defence of their eggs or young, and a female Golden Pheasants flew off her eggs, hitting me in the face and making my lip bleed. This happened so fast that I do not know whether the beak or claws did the damage. Such attacks obviously pose a threat to the keeper's eyes.

Pheasants' courtship displays are, of course, renowned for being spectacularly beautiful. Peafowl appear to display frontally only (facing the object of interest), whereas the *Polyplectron* spp. and Monals have both frontal and lateral (sideways) displays. All the others display laterally. In most cases similar body language signifies both sexual and aggressive intent. Full displays may be performed by either sex. Peafowl chicks, for example, regularly fan their tails, and an adult female Grey Peacock Pheasant will display sexually to an immature, submissive or disinterested male, or aggressively to a female rival. I have seen Golden Pheasant poults no bigger than Blackbirds *Turdus merula*, perform complete displays ending in apparent copulation.

Pheasants can be long lived. I know of a male Silver Pheasant that was put-down when in its early twenties, when it had lost the use of its legs and after it had sired young the previous year. Golden and Lady Amherst Pheasants have died at 11 years old, and I currently have a male Grey Peacock Pheasant hatched in 1987 that shows no sign of old age. Germain's have not lived beyond 10 years. *Chrysolophus* and *Polyplectron* spp. of both sexes are fertile at a year old, even though the males are still in juvenile plumage. Red Junglefowl, Kalij and Common Pheasants are also fully mature in their first season. Females of the others, including peafowl, can lay eggs at a year old, but the males are not necessarily fertile; Silver and Swinhoe's Pheasants usually are not.

One of the minor pleasures of keeping the long tailed species has been picking up their moulted train or tail feathers to put in a vase. Those of peafowl, Reeves' and Lady Amherst are particularly attractive but the latter two often break their tail feathers off short before the moult. This is caused partly by them turning round in confined spaces and careful aviary design can help prevent this. A visual barrier at ground level will stop them trying

to attack potential rival males in adjoining pens, and in doing so breaking their feathers on the wire. A circular aviary, with appropriate shelter and planting in the middle, to avoid the damage done to tail feathers in corners, might be an ideal design for these species. Large enclosures are conducive to perfect plumage. However, a male Reeves' a friend had in a 7ft (approx. 2.1m) square aviary kept a 5ft (approx. 1.5m) long tail for months, while one turned out in my waterfowl enclosure smashed all its tail feathers within hours, partly owing to a lot of bushes along the perimeter fence.

Having kept a variety of species over the years, I am currently down to three favourites, pairs of Golden Pheasant, Blue Peafowl and Grey Peacock Pheasants. The peacock pheasants share a heavily planted aviary some 24ft (approx. 7.3m) long with Pekin Robins and Turtle Doves *Streptopelia turtur*. Their non-browsing habits mean that the enclosure keeps an attractive 'jungle' aspect and I have to keep an area clear in order to see them. Golden Pheasants in a similar sized enclosure share with Ring-necked Parrakeets *Psittacula krameri* and laughing thrushes *Garrulax* spp. The Golden species being more herbivorous by nature, means that the Elder bushes never look their best, while the Hawthorn, Sycamore and a small conifer remain unmolested. Ivy *Ilex* sp. on the back wall is eaten back as far as the pheasants can reach. The 40ft (approx. 12m) peafowl aviary houses a collection of doves and a colony of Java Sparrows and supports several large *Lonicera*, a big Elder (put in originally many years ago as a roof support, when supposedly a dead trunk) and several conifers. I now find more interest in keeping fewer species in relatively large enclosures that I once did when keeping seven or eight different species in smaller quarters.

References and Bibliography

Beebe, W. 1937. *Pheasants, Their Lives and Homes*. Robert Hale Ltd.
Delacour, J. 1977. *The Pheasants of the World*. Second edition. Spur Publications.
Edlin, H. L. 1970. *Collins Guide to Tree Planting and Cultivation*. Collins.
Gruson, E. S. 1976. *A Checklist of the Birds of the World*. Collins.
Howman, K. 1993. *Pheasants of the World, their Breeding and Management*. Hancock House.
Roles, D.G. 1976. *Rare Pheasants of the World*. Spur Publications.
Wayre, P.A. 1969. *A Guide to the Pheasants of the World*. Hamlyn.

THE HIGH OCCURRENCE OF BROOD PATCHES IN MIST-NETTED BIRDS IN A LOWLAND ECUADORIAN RAINFOREST

by Harold F. Greeney, Caleb E. Gordon, Matthew E. Kaplan & Charles G. Chimera

The diversity of tropical bird species has long been a subject of interest among biologists and amateur birdwatchers alike. Ecuador alone is thought to contain over 1,600 species of birds, many of which are spectacularly unique in their plumage. Because of the interest shown by biologists and amateurs, the bird fauna of tropical areas is well known in comparison to other types of organisms. The discovery of new species and the accumulation of ecological information continues, however, and contributions of this sort are invaluable to tropical biologists and conservationists. In light of the ever increasing threat to tropical habitats, gathering and publishing data on these beautiful creatures has never been more crucial.

From December 21st to December 27th 1996, we conducted a mist-net survey of tropical birds in the Sucumbios Providence of eastern Ecuador. A total of 32 birds was captured at the La Selva Lodge and Research Station located 75km (approx. 46miles) e.s.e. of Coca along the Napo River at an elevation of 250m (approx. 800ft). Birds were removed from the nets, evaluated for breeding condition and released. We were amazed at the number of birds that were in breeding condition at the time of capture. A summary of those with brood-patches can be found in Table 1.

The fact that so many of the netted birds were in breeding condition at this time of year possibly reflects the fact that this is near the peak of the dry season in this area. A marked increase in the numbers of butterfly and moth caterpillars was noticed during further fieldwork in the area, and many plant species were observed to fruit during this time of year. These observations may represent an increase in food resources for insectivorous and frugivorous birds. This may help to explain the high number of brood patches observed in birds which may have been taking advantage of higher food availability by breeding during this period.

We wish to thank Eric and Maggie Schwartz for their hospitality at the La Selva Jungle Lodge and Genoveva Salem for her logistical help. Thank you to M. Lysinger for help and encouragement during all of our ornithological work in Ecuador. For continued support of his work in tropical forests, H. Greeney gives special thanks to Bob and Katt Azar who graciously donated money to help fund the completion of this and other work.

Table 1. Breeding condition of birds collected in mist-nets

Species	Sex	Date	Brood Patch	Species	Sex	Date	Brood Patch
White-bearded Hermit *Phaethornis hispidus*	?	Dec 22	No	White-flanked Antwren *Myrmotherula axillaris*	M	Dec 23	Yes
Long-tailed Hermit *Phaethornis superciliosus*	?	Dec 24	No	Plain-throated Antwren *Myrmotherula hauxwelli*	M	Dec 22	No
White-chested Puffbird *Malacoptita fusca*	?	Dec 25	Yes	Plain-throated Antwren *Myrmotherula hauxwelli*	M	Dec 25	Yes
Wedge-billed Woodcreeper *Glyphorynchus spirurus*	?	Dec 22	No	Plain-throated Antwren *Myrmotherula hauxwelli*	M	Dec 23	Yes
Wedge-billed Woodcreeper *Glyphorynchus spirurus*	?	Dec 22	Yes	White-cheeked Antbird *Gymnopithys leucaspis*	?	Dec 24	Yes
Plain-brown Woodcreeper *Dendrocincla fuliginosa*	?	Dec 24	No	Black-faced Antbird *Myrmoborus myotherinus*	M	Dec 25	Yes
Elegant Woodcreeper? *Xiphorhynchus* sp.	?	Dec 23	No	Blue-crowned Manakin *Pipra coronata*	F	Dec 21	Yes
Elegant Woodcreeper? *Xiphorhynchus* sp.	?	Dec 23		Wire-tailed Manakin *Pipra filicauda*	F	Dec 26	Yes
Plain Xenops *Xenops minutus*	?	Dec 24	Yes	Wire-tailed Manakin *Pipra filicauda*	M	Dec 26	Yes
Plain Xenops *Xenops minutus*	?	Dec 27	Yes	Ochre-bellied Flycatcher *Mionectes oleaginea*	?	Dec 25	Yes
Short-billed Leaftosser *Sclerurus rufigularis*	?	Dec 25	No	Ochre-bellied Flycatcher *Mionectes oleaginea*	?	Dec 27	Yes
Dusky-throated Antshrike *Thamnomanes ardesiacus*	F	Dec 23	Yes	White-necked Thrush *Turdus albicollis*	?	26 Dec	Yes
Cinereous Antshrike *Thamnomanes caesius*	M	Dec 24	Yes	Lawrence's Thrush *Turdus lawrencii*	?	Dec 22	Yes
Cinereous Antshrike *Thamnomanes caesius*	M	Dec 27	Yes	Rufous-bellied Euphonia *Euphonia rufiventris*	M	Dec 25	Yes
Cinereous Antshrike *Thamnomanes caesius*	F	Dec 23	Yes	Blue-black Grosbeak *Cyanocompsa cyanoides*	F	Dec 23	Yes
White-flanked Antwren *Myrmotherula axillaris*	F	Dec 23	Yes	Blue-black Grosbeak *Cyanocompsa cyanoides*	M	Dec 26	No

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NOTES AND OBSERVATIONS ON HAND-REARING AFRICAN PYGMY FALCONS
Polihierax semitorquatus

by Chris Smith

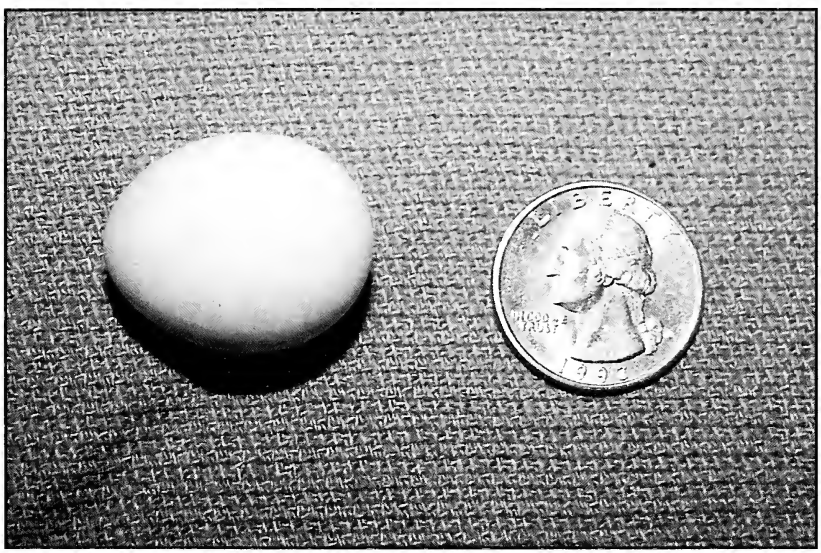
The African Pygmy Falcon *Polihierax semitorquatus* measures about 20cm (almost 8in) in length and has a wingspan of about 37cm (14.5 in). Its weight ranges from 54g-67g, with females tending to be slightly heavier than males. African Pygmy Falcons are sexually dimorphic. Males are light to slate grey on the back and upperwing. They have a white collar or patch of white on the nape, and the flight feathers and tail are dark brown to black with white spots. The underparts are white. The legs and feet are orange-yellow with black talons. Females share most of these characteristics except that they have a chestnut brown cape extending from the back of the neck to the middle of the back. Juveniles are distinguished from adults by having buff underparts with dark streaks. A rufous wash is also present on the back and underparts, which is more evident in young females.

The African Pygmy Falcon is found in two distinct regions of Africa. The eastern population is found in southern Sudan, southern Ethiopia, Somalia, north-eastern Uganda, Kenya, northern Tanzania and eastern Zaire. The southern population is found in southern Angola, Namibia, Botswana and north-western regions of South Africa. Both these areas have similar habitat, namely semi-arid savanna and scrub with sparse ground cover and trees. The two populations are recognized sometimes as subspecies, with the eastern race *P. s. castanotus* being slightly larger and darker than the southern race *P. s. semitorquatus*. However, the differences between the two are inconsistent and may require further studies to be validated. The African Pygmy Falcon is normally sedentary, migrating only during periods of prolonged drought.

African Pygmy Falcons are rather unusual in their nesting habits, in that they nest almost exclusively in weaver colonies. Two species of weavers in particular are imposed upon by the falcons: the Social Weaver *Philetairus socius* found in south-west Africa, and the White-headed Buffalo Weaver *Dinemellia dinemelli* found in east Africa. Social Weavers are, of course, well known for constructing massive multi-chambered nests capable of supporting up to 50 breeding pairs of weavers. The Pygmy Falcons will supplant a pair or two of weavers in order to use a few chambers themselves. The falcons and weavers usually live together in harmony, although the falcons will occasionally prey upon weaver nestlings. African Pygmy Falcons are found in an estimated 25% of weaver colonies. Some observations suggest the weavers may benefit from the falcons' presence, in

that they provide a more effective defence against snakes entering the nest complex. This suggestion may only apply in the case of the Social Weavers however, as White-headed Buffalo Weavers being larger and heavier than African Pygmy Falcons, could certainly just as easily repel an intruding snake.

The breeding season is usually from March to June for the eastern population, and from August to October for the southern population. Two to four eggs are laid per clutch. The eggs are white and measure approximately 28mm x 23mm. Incubation normally lasts 28-30 days. The female does most of the incubation, but the male will tend the eggs when the female leaves the nest. The male also provides food for the female and the young and defends the nest. Chicks fledge at four to five weeks and



Chris Smith

Egg alongside US25¢ coin

remain with their parents for approximately two months before dispersing.

The African Pygmy Falcon is common and widespread throughout its range. As the weavers expand their range by nesting on man-made structures such as utility poles and windmills the pygmy falcons are expanding their range as well. They are rarely found beyond the ranges of the weavers. Although not endangered, the African Pygmy Falcon is listed on Appendix II of CITES to protect it against potential over-collecting and export. These birds range over several national parks and reserves, which should help preserve their habitat.

The International Species Information System 1998 *ISIS Bird Abstract* reported the captive population of the African Pygmy Falcon as 37 (21.13.3) in 13 institutions. All of these are in North America. The Oklahoma City Zoological Park has two breeding pairs of this species.

Husbandry

The Oklahoma City Zoological Park has maintained the African Pygmy Falcon since 1994. These birds are housed in an off-exhibit building for breeding. Their enclosures measure approximately 2m x 2m x 2.5m (about 6ft 6in x 6ft 6in x 8ft 4in) and have a pine shavings substrate. The diet consists of newborn mice, Nebraska Bird of Prey Diet, crickets, waxworms and mealworms. Live anoles *Anolis* sp. are offered on a regular basis for dietary and behavioural enrichment. Adult mice are not offered because of problems with impactions of mouse fur. Vionate for general vitamins and minerals, Osteo-form for calcium replenishment and Nekton-E for vitamin E, are sprinkled over the food. Breeding success has improved and hatchlings have appeared healthier since vitamin E has been added to the diet.

Although the African Pygmy Falcon is particular about its choice of nest site in the wild, captive falcons will readily use small wooden nest-boxes. Nest-boxes used at Oklahoma City Zoological Park measure roughly 15cm x 20cm x 20cm (about 6in x 8in x 8in), with an opening about 5cm (2in) in diameter. The nest-boxes are placed about 2m (6ft 6in) above the floor. So long as a suitable nest-box has been provided, the captive falcons have not been partial to a particular time of the year for breeding.

The Oklahoma City Zoological Park has been breeding African Pygmy Falcons since August 1995. The first three clutches were infertile. After a clutch was removed from the nest-box, the falcons would within a few days begin to lay a new clutch. In January 1996, fertile eggs were produced, but failed to hatch. After subsequent clutches failed to hatch, eggs were removed from the nest-box and incubated artificially.

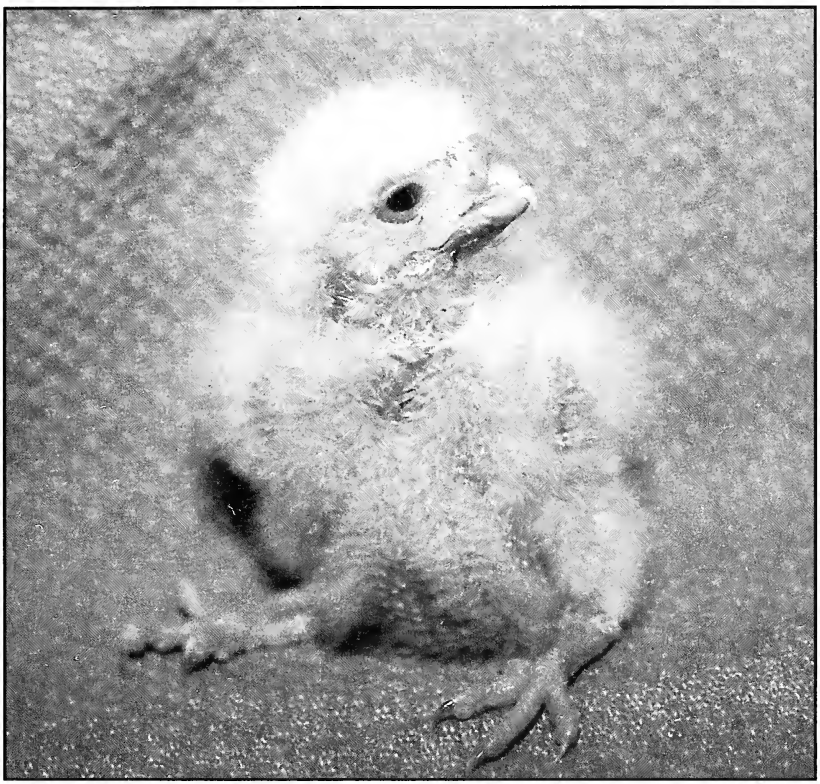
On several occasions, when eggs were removed, dummy eggs were put in the nest-box with the intention of returning the real eggs when they were ready to hatch. The first time dummy eggs made from porcelain were used, but were immediately rejected by the parents and tossed from the nest-box. For later attempts, infertile eggs filled with plaster were used and these were accepted by the breeding pair. Unfortunately though, attempts at replacing the real eggs were unsuccessful due to them being infertile, the embryo having died at an early stage, or the parents losing interest in the nest.

Incubation and hand-rearing methods

Eggs, on being removed from the nest-box, are placed in an incubator at a temperature of 37°C (98.6°F) and 45%-50% humidity. The eggs are rotated

half-way in alternate directions five times a day. Between 28 and 30 days pipping occurs. Within 24 hours of pipping, chicks normally have completed the hatching process. In one instance, a chick took 35 days to hatch.

For some chicks, the hatching process is difficult and assistance is required. Enlarging the break in the egg shell is usually enough to help the



Chris Smith

Chick at one week old

chick during hatching. Removing the chick entirely from the shell has been performed only after the chick had not hatched within 48 hours of pipping.

After hatching, chicks are left in the incubator for an additional 24 hours to dry and absorb the yolk sac. Afterwards, chicks are placed in an isolette at a temperature of 35°C (95°F). The temperature is gradually reduced so that the chicks remain comfortable as they grow and get their feathers. Cloth covered bowls with small sticks lining the bottom for the chicks to grasp are used as nests. The use of sticks seems to help prevent the chicks' legs from splaying.

The diet at this age comprises mainly finely chopped newborn (pinkie) mice. Chopped waxworms and cricket abdomens are offered after the first week. Chicks are given the same vitamin supplements (Vionate, Osteoform and Nekton-E) as the adults. They are offered food five times during the day, at two hour intervals. An additonal evening feed (usually three to four hours after the last daytime feed) is offered during the first week.

Chris Smith

Two to three weeks old

Growth and development

Upon hatching chicks are covered with white down and the eyes are not yet open. A day old chick usually weighs 5g-6g. After three or four days, the eyes slowly begin to open. Contour feathers begin to grow at two weeks. Flight feathers emerge during the third week. At this age, chicks become very active in the nest, perching on the rim of the bowl, hiding underneath sections of cloth and exploring the isolette. At four weeks, the chicks are almost fully feathered and begin eating food from a dish, rather than being hand-fed.

By four weeks of age the chestnut coloured cape characteristic of females becomes visible. However, sexing birds of this age by visual identification does not seem to be wholly reliable. One chick initially showed the chestnut

cape pattern of a female, but eventually developed male plumage. This particular chick began growing a chestnut cape, at three to four weeks of age. At approximately eight weeks, however, the cape began to slowly recede, and by the twelfth week the young bird had lost the cape and taken on the appearance of a male.

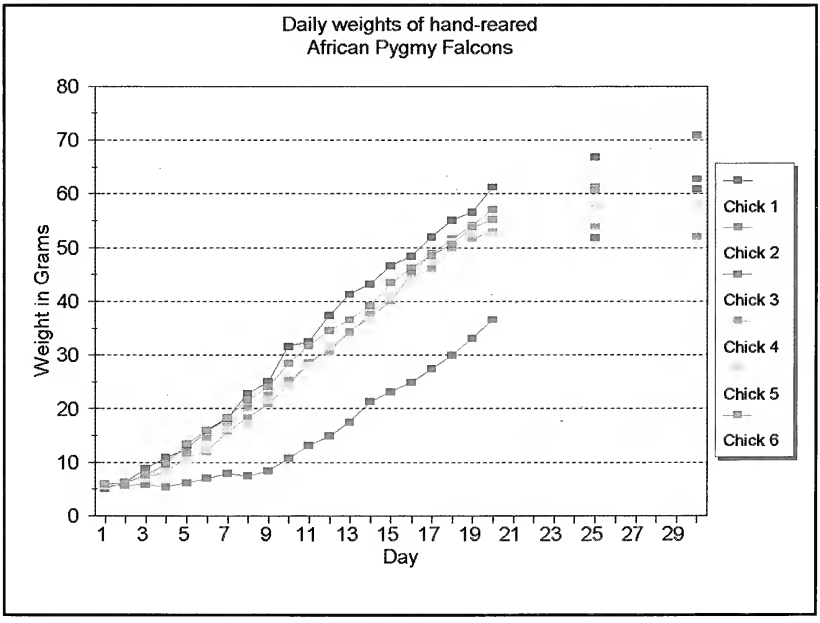
To add to the confusion over understanding the development of young African Pygmy Falcons, a second hand-reared male did not develop a female-like chestnut cape as its older brother had. Based on these observations it appears African Pygmy Falcons cannot be positively sexed by a simple visual examination until at least three months of age.

Table 1. Daily weights (in grams) of hand-reared African Pygmy Falcons

Day						
1	5.2	5.9	5.8	5.6	6.0	6.0
2	6.2	6.3	5.7	6.5	6.5	6.3
3	8.9	7.3	5.9	7.2	6.9	7.7
4	10.9	8.1	5.4	9.6	8.0	9.7
5	12.5	10.9	6.2	12.0	10.4	13.4
6	15.9	12.0	7.0	14.5	12.3	16.0
7	18.2	15.8	8.0	16.8	16.1	18.4
8	22.8	18.2	7.5	20.2	17.1	21.6
9	25.0	20.8	8.4	22.6	21.5	24.1
10	31.6	24.4	10.7	25.2	24.2	28.4
11	32.5	28.5	13.2	28.0	28.0	31.7
12	37.4	31.1	14.9	30.6	31.4	34.6
13	41.3	34.3	17.5	34.1	36.2	36.6
14	43.2	37.0	21.3	37.5	36.5	39.2
15	46.6	40.0	23.1	40.5	40.6	43.4
16	48.4	45.2	24.9	44.2	44.0	46.2
17	52.0	48.8	27.4	46.0	47.4	48.5
18	55.1	51.5	30.0	49.2	51.1	50.6
19	56.6	54. 1	33.1	51.7	52.3	53.8
20	61.2	57.0	36.6	52.8	52.3	55.2
25	66.8	61.1	51.8	53.8	57.8	60.7
30	60.8	70.8	62.7	52.0	58.0	

Chris Smith

Three weeks old



Chris Smith

African Pygmy Falcon in juvenile plumage

Medical problems and treatments

Medical problems were encountered with three chicks shortly after hatching. Each of these chicks exhibited similar symptoms, namely poor coordination difficulty maintaining its balance and a lack of appetite. The general appearance seemed to be that of a neurological disorder. The affected chicks' heads would tremble, they would turn in circular patterns in their

nest bowl and had very poor feeding responses.

These chicks were treated with a booster shot of fortified vitamin B complex, and sulfamethoxazole and trimethoprim suspension (0.04mg for a 6g chick), given twice a day for 10-14 days. Medications were administered orally via a syringe capped with a blunt-tipped dental applicator. Using this, the chick's beak could be gently prized open and the tip of the syringe inserted inside the chick's beak, without injuring the chick. Dextrose injections were given subcutaneously if the chicks did not show an improvement within two days.

Of three chicks that were treated, two survived. The first chick that was treated did not survive. The second chick recovered about one week after receiving treatment. The third chick, whose symptoms were noticed at an earlier age and which received treatment immediately, was behaving normally after the first day of treatment. Both of the surviving birds were treated for the full 10-14 days.

Identification of a specific cause of the chicks' illness was inconclusive. Based upon the responses of the chicks to the medications, it is believed bacterial infection was involved.

Summary

The Oklahoma City Zoological Park has been successful breeding African Pymgy Falcons since 1996. Although attempts to allow the parents to hatch and rear their young have been unsuccessful, chicks have been produced by artificial incubation and hand-rearing methods.

Observations of juvenile birds have shown an inconsistent development pattern, at least in males. The characteristic chestnut cape of the adult female has been observed to develop and later recede in the case of one young male pymgy falcon. This change in plumage was not observed with a later male.

Medical intervention has been successful in two out of three cases in which each chick displayed similar neurological disfunctions, due probably to bacterial infections.

Among zoological institutions, the African Pygmy Falcon has in recent years become one of the more sought after species. It has been recommended by the Raptor Taxon Advisory Group (TAG) that zoos establish a viable captive population. A studbook is being researched. The Oklahoma City Zoo has been one of the more successful institutions raising African Pygmy Falcons during the past few years, having raised six chicks between 1996 and 1999. The zoo is continuing to undertake research into the best means of housing and breeding the African Pygmy Falcon.

Acknowledgements

To the Oklahoma City Zoological Park Bird Department: Darcy Henthorn, Neil Carter, Jeff Papp and Mary MacFarland, Jim Fish, Curator of Birds, Jack Grisham, General Curator, Dr Michael Barrie, DVM, Dr Pilar Hayes, DVM and Stephen R. Wylie, CEO/Executive Director.

Products mentioned in the text

Agrifarm Fortified Vitamin B Complex Injectable: manufactured by Dealer Distribution of America, Porterville, California, USA.
Dextrose Injection, USP: produced by Abbott Laboratories, North Chicago, Illinois, USA.
Nekton-E: produced by Nekton-Produkte, Germany.
Nebraska Bird of Prey Diet: packaged by Central Nebraska Packing, Inc., North Platte, Nebraska 69101, USA.
Osteo-form: manufactured by Vet-A-Mix, Shenandoah, Iowa 51601, USA.
Sulfamethoxazole and Trimethoprim Oral Suspension, USP: produced by Hi-Tech Pharmacal Co., Inc., Amityville, New York, USA.
Vionate: vitamin and mineral powder manufactured by Gimborn-Rich Health, Atlanta, Georgia 30340, USA.

Bibliography

Brown, L. and Amadon, D. 1989. *Eagles, Hawks & Falcons of the World.* The Wellfleet Press, Secaucus, New Jersey, USA.
Brown, L., Urban, E. and Newman, K. 1982. *The Birds of Africa.* Vol 1. Academic Press Inc., New York, USA.
del Hoyo, J., Elliot, A. and Sargatal, J. eds. 1994. *Handbook of the Birds of the World.* Vol.2. New World Vultures to Guineafowl. Lynx Edicions, Barcelona, Spain.
International Species Information System. 1998. *ISIS Bird Abstract.* Apple Valley, Minnesota, USA.
Tarboton, W. 1990. *African Birds of Prey.* Cornell University Press, Ithaca, New York, USA.
Zimmerman, D. and Turner, D, 1996. *Birds of Kenya and Northern Tanzania.* Princeton University Press, Princeton, New Jersey, USA.

Chris Smith, the author of the above article and who wrote recently about hand-rearing Puna Ibis Plegadis ridgwayi (Avicultural Magazine 105, 2: 65-71), is an Animal Technician at Oklahoma City Zoological Park, 2101 NE 50th, Oklahoma City, Oklahoma 73111, USA. Tel:(405) 424-3344/ Fax:(405) 425-0207.

STITCHBIRDS - AN AVICULTURAL CHALLENGE

by Rose Collen, Glen Holland, Caroline Twentyman,
Jerry Pauli & Betty Watt

The Stitchbird *Notiomystis cincta*, a New Zealand endemic, belongs to the Order Passeriformes, family Meliphagidae (honeyeaters) and is the sole member of the genus *Notiomystis*. The Meliphagidae family includes over 170 species of honeyeaters, miners, friarbirds and sugarbirds. They are distributed primarily through Australia, New Guinea, Timor and the Pacific islands. The Bellbird *Anthornis melanura* and Tui *Prosthemadera novaeseelandiae* are the only other members of the family that occur in New Zealand.

Rose Collen

The male, as part of its display, raises its 'ear' tufts and cocks its tail

Stitchbirds, known also by the Maori name *hihi*, are one of only two honeyeater species known to nest in tree cavities. The name Stitchbird originates from the bird's contact call, which resembles the word 'stitch'. Both sexes also have a soft warbling song and an excited alarm call, and

males have a three-note whistle and also mimic other species. In pre-European times (it is believed that Europeans introduced rodents and mustelids) Stitchbirds were distributed throughout the North Island and a number of the surrounding islands. By 1885 Stitchbirds had disappeared from the mainland, possibly as a result of predation at their nest sites by ships' rats. Currently the only self-sustaining population resides on Little Barrier Island in the outer Hauraki Gulf. The Department of Conservation has recently reintroduced them to a further three islands, where intensive management and monitoring continues. To date none of these three

Rob Suisted

Female. The berries are coprosma berries and are eaten by Stitchbirds

populations is considered to be successfully established.

The Mt Bruce National Wildlife Centre (NWC) is the only facility holding captive Stitchbirds. The NWC is operated by the New Zealand Department of Conservation and is dedicated to the breeding and restoration of rare and endangered New Zealand bird species. The Department of Conservation Stitchbird Recovery Plan uses a captive breeding programme to:

Develop effective husbandry techniques to be used in the event of a disaster affecting the only viable wild population.

Trial techniques that could assist in establishing new self-sustaining populations.

The plan also acknowledges the environmental education role the species can play. While Stitchbirds have been held and bred in captivity for over 14 years, there remain several challenges regarding their husbandry, including further disease research, development of hand-rearing protocols and trialing new aviary designs that will reduce disease risk. In the wild, bad fruiting and flowering seasons can cause low productivity. In poor years, many second and third clutches are deserted. These could in future provide a source of birds for hand-rearing. In addition, disease-free hand-raised birds for future research could be sourced from eggs from the captive population which currently stands at 2.5.

There have been nine male and six female Stitchbirds brought in to Mt Bruce since 1985. The reasons for fledged juvenile and adult deaths over the past 10 years were recorded as:

	89	90	91	92	93	94	95	96	97	98
Aspergillosis	1	1	3	-	1	-	1	1	1	1
Coccidiosis	-	-	-	-	-	1	-	-	-	-
Asphyxiation	-	1	-	1	-	-	-	-	1	-
Stress	-	-	-	-	-	-	2	-	-	1
Other	2	1	3	3	-	2	1	1	3	2

Diet

In the wild Stitchbirds feed on a variety of nectar plants, fruit and invertebrates. The current artificial/captive diet is modelled on this and is offered daily in three separate bowls, with a top-up as required when they are rearing chicks. The current diet consists of:

Jam water: 250ml of apple and raspberry jam and a tablespoon each of bee pollen and Pronutro, blended in 1 litre of water. The pollen is a valuable nutritional supplement that is now popular with nectivores and species such as lorikeets. Pronutro is a cereal-based South African product (22% protein) that one of the authors (G.H.) used in South Africa to raise species ranging from estrildids to parrots.

Wombaroo lorikeet nectar: a milk by-product-based nectar with <0.5% lactose, produced in Australia.

A fruit/vegetable puree (finely blended) which includes sweetcorn, carrot, grapes, apple, pear and orange, made in a large batch and stored frozen in the amounts required each day.

Our captive Stitchbirds are also offered a variety of natural foods. In addition to access to the plants growing in the aviaries, they receive an almost daily supply of nectar-bearing flowers or a bunch of wild fruits (e.g. *Coprosma* sp.). These are placed so as to enhance public viewing of foraging birds. Livefood, particularly moths, is readily caught using two fan/light

insect traps. Live insects are provided mainly during the breeding season, with priority being given to females with young. Small crickets, waxmoth larvae and mealworms have also been offered, but have not proved successful. In future we intend to introduce these to hand-raised birds at an early age.

Causes of death in captive Stitchbirds

Aspergillosis

This fungal disease caused most frequently by *Aspergillus fumigatus* is seen most commonly in its chronic form at the NWC. This is characterised by rapid respiration, lethargy, anorexia and weight loss. *Aspergillus* is a ubiquitous fungus that grows well in soil and organic matter. Transmission occurs through birds inhaling the spores. Damp organic litter encourages the production of large numbers of spores. Problem sites include damp nest-box material, dusty environments and accumulations of mouldy food scraps. Factors we have decided are important in the epidemiology of the disease in this species in captivity are:

Environmental:	Cage set-up
	Access to leaf litter
	Local weather effects
	Food hygiene
Bird Factors:	Species susceptibility
	Diet
	Stress

Management changes have been implemented that we hope will lessen the impact of the above factors and control this condition. When the disease is suspected, the bird is treated with a combination of Ancotil and Diflucan.

Atoxoplasmosis

The first diagnosed case of coccidiosis in Stitchbirds at the NWC occurred in 1994. Analysis of mortalities show that it is now the most important disease affecting Stitchbirds at Mt Bruce and causing the death of young birds. We are reasonably certain that the coccidial infections in Stitchbirds at the NWC are due to *Atoxoplasma* organisms. These produce oocysts that are passed in the faeces and are indistinguishable from other isosporan species. We have established the times when deaths from coccidiosis are most likely to occur here. These are:

1. In very young birds, in one case the entire second brood of a pair was lost at 16 days of age. There was also a severe red mite infestation and capillaria was present.

2. In fledged birds separated in to flocking aviaries, when the stress caused by moving them can allow a low-level coccidial infection to flourish.

Rose Collen

Dosing an infected chick

We have endeavoured to establish a preventative programme for coccidiosis which enables successful breeding to take place. This programme involves.

1. Hygiene.
2. Preventative treatment.
3. Faecal monitoring.

Treatment is at present based on Toltrazuril (Baycox), which unfortunately is only active against the gut forms of *Atoxoplasma*. We are also trailing a coccidiostat and Primequin (a malarial treatment) in combination with Baycox. **We are keen to learn of any other treatments that aviculturists have used successfully in the treatment/control of atoxoplasmosis.**

Stress

Stress related deaths have been attributed to aggression by a male towards females and birds recently brought in to captivity from the wild. Handling in order to fit a transmitter prior to transfer/release is also suspected to have caused stress-related death in one bird, in another case, two six month old males died following a severe territorial dispute. Some of these birds also had aspergillosis.

Asphyxia

Since 1990 there have been three deaths from asphyxia, all in birds less than one year old. Two involved arthropods, and in the other a whole kernel of corn was stuck in the pharynx.

Other causes

There have been a number of other causes of mortality, most of which have appeared as isolated cases and hopefully these will not re-occur.

Coccidial research

Because of the importance of coccidiosis as a cause of death in captive juvenile Stitchbirds, a group at Massey University, Palmerston North, has been carrying out research into this disease. It is believed that the organism responsible is a type of coccidia known as *Atoxoplasma*, however, the exact identification and life cycle are unknown. There are many questions that need answering:

How does infection occur and when?

How does infection with this parasite cause disease?

At what age do birds become resistant?

How common is this organism in free-living Stitchbirds and does it cause disease?

Is this same organism found another species of birds or does it infect only the Stitchbird?
Which treatments are most effective?

The research group has been provided with tissues from all the Mt Bruce Stitchbirds that have died of this disease since 1994, and has been able to examine their pathology in detail. Regular examination of Stitchbird faeces for evidence of the coccidial oocysts has also been undertaken. In addition, faeces from other bird species and from free-living Stitchbirds have been examined. So far, it has been found that free-living Stitchbirds carry similar coccidia to those in captivity, but there has been no evidence of disease in wild birds. Transmission experiments using Zebra Finches *Taeniopygia guttata* are in progress at present. In these experiments oocycsts from Stitchbirds were inoculated via the mouth into a number of parasite-free finches and faeces from these finches were then tested twice daily for evidence of coccidia. At pre-determined times the finches were euthanased and necropsied, and the tissues examined microscopically in order to detect any sign of coccidia or changes induced by them. It is necessary to sporulate the coccidial oocysts in the laboratory (i.e. encourage them to change their form into their infective stage) before identification can be attempted or transmission experiments undertaken. A major obstacle encountered is that Stitchbird oocysts from Mt Bruce appear to be unresponsive to conventional methods used to stimulate sporulation, and require oocysts to be sourced from other Stitchbird populations. Further work is required in order to understand the mechanisms of infection and disease and minimise the effects of this parasite.

Captive husbandry

Stitchbirds at Mt Bruce are held in large bush aviaries measuring at least 10m x 10m x 4m high (approx. 32ft x 32ft x 13ft high). Each aviary has an interior divider creating two flights. The aviary floor is natural, with fresh leaf-litter added regularly to boost insect numbers. Insects, particularly winged ones, such as moths, are an important component of the Stitchbird's diet, and they spend much of their time foraging amongst the vegetation for these, especially when rearing chicks. The large size of the aviaries allows the many plant species to grow to maturity and provide some of the fruits and flowers which Stitchbirds utilize in the wild. The large volume of vegetation also provides good habitat for an abundance of invertebrate life.

Adult birds have to be held in separate flights for most of the year, as they are very aggressive and competitive. This applies not only birds of the same sex, but also by males towards females. This aggressive behaviour is compounded by the fact that they are held in captivity, and subordinate birds

in an aviary are unable to escape harassment by dominant birds. This social stress has led to health problems (see chart, page 24). Some individuals, however, usually older experienced males with females, are compatible. Pairs held together require careful monitoring to ensure social problems do not develop. Juveniles are housed together until they are approximately two months old, when levels of aggression among them gradually escalate and they need to be separated. The need to house all birds separately has limited our ability to hold many birds and has compromised research into captive husbandry and disease.

Glen Holland

Clutch of eggs in nest

The Stitchbird breeding season begins in October and final clutches can be laid as late as February. Captive females may rear two to three clutches of up to four chicks per brood. They will make up to four nesting attempts if early clutches are unsuccessful. Stitchbirds are unusual nesters - usually entering a cavity and building a platform upwards. We therefore provide nest-boxes that have the entrance hole at the base. The base of the nest consists of a tower of coarse twigs, grading into finer materials such as fern rhizomes and leaf skeletons. The nest cup is thickly lined with tree fern scales. In the wild, the bases of some nests are up to 30cm (almost 12in) high. Each aviary has three nest-boxes in the female's flight from which

she can choose, and one in the male's flight close to the dividing wall. In an effort to 'impress' the female, the male will begin to build a small nest in his box (in the wild they try to lead the female to nest sites). This behaviour sometimes helps stimulate the female next door to start building. The nest-boxes we provide measure 30cm x 25cm x 40cm high (approx. 12in x 10in x 16in high).

Rose Collen

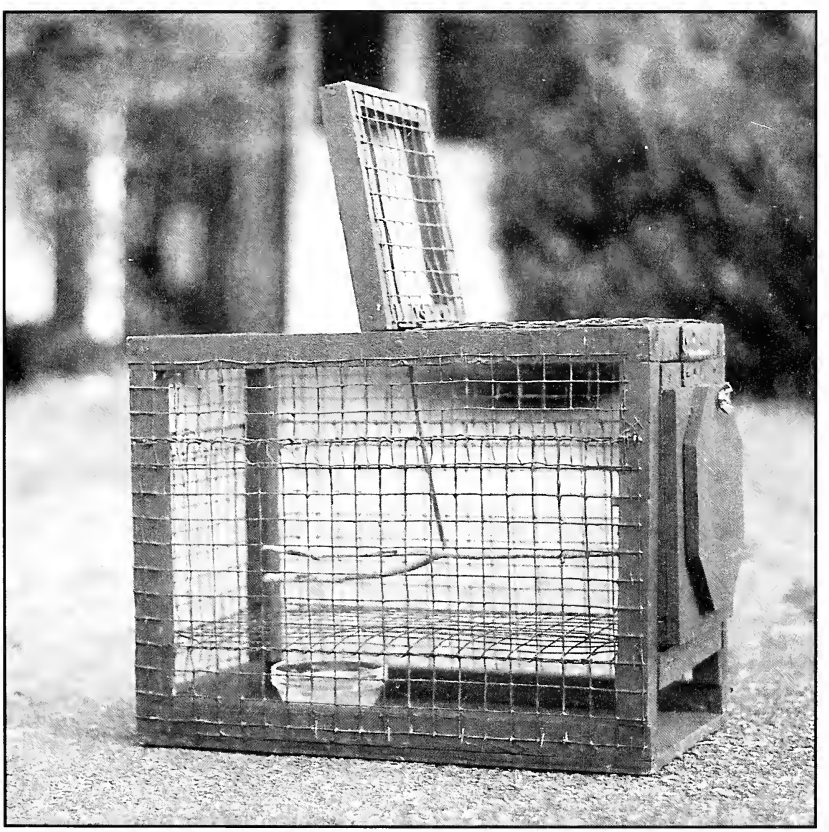
Banding a fledgling

The breeding season can be a very stressful time for Stitchbirds. The males have high levels of testosterone and will pursue the female and mate with her many more times than is necessary for fertilisation. When the female, with soft calls and tail up, solicits mating, the male will usually copulate with her in the normal manner. Often, however, copulation is forced, with the male chasing the female down to the ground and mating with her in a face-to-face position (unique among birds) - with claws locked and wings spread over her to prevent her escaping. The repeated chasing and 'rape' is a cause of much stress to the female. If such attacks persist for too many days the female will resort to hiding from the male. In the captive situation she may even be unable to feed sufficiently or get opportunities to build a nest.

We now hold the male and female of a pair in adjacent flights during the

season, thus stimulating the female to nest-build without harassment by the male. When she has nearly completed nest building, her weight is carefully monitored with an automatic scale at the feeding station, and from this we can determine when she is ready to lay. We then introduce the male into her flight. Depending on the degree of aggression shown by the male, we either separate the pair after copulation has been observed, at the end of each day, or if little aggression is observed, the male is left in the female's flight for a week until egg laying is completed. One male was allowed to remain with the female throughout incubation and to assist with rearing the chicks. Females are capable of rearing chicks on their own, but if the male is present he can contribute up to one-third of the feeds.

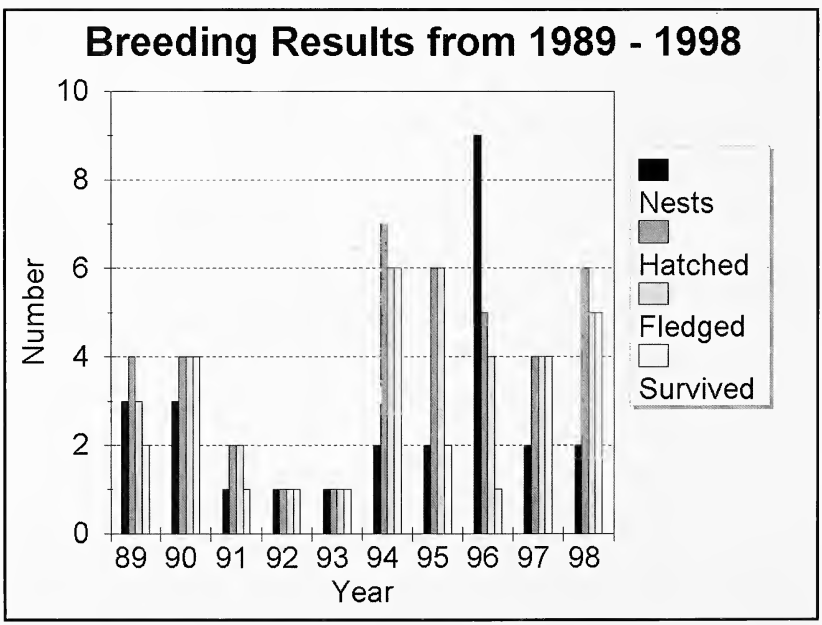
Stitchbirds at Mt Bruce usually lay three to four eggs in a clutch. On occasions five eggs have been laid, but in these cases no more than four of them have hatched. After about 10 days it is possible to see the embryo



Rose Collen

Capture trap

developing inside the translucent egg shell. This can be done without candling the eggs or even needing to handle them. It means they can easily be checked for fertility by looking in the nest-box when the female is off the nest. When the eggs are due to hatch, the nest is checked twice daily to monitor progress. Any eggs which do not hatch within a day of the first are candled. Dead in shell or infertile eggs are removed immediately, as nests have been abandoned when dead in shell eggs were left with young chicks. The nestling period is 28 days, during which time the chicks are checked daily. Fortunately the parents tolerate a fairly high level of disturbance at the nest. By the sixth day the chicks are passing relatively solid faeces, which are collected daily for disease screening. The faeces are screened for capillaria and coccidia loadings, so that treatment can begin immediately infection occurs. If left untreated, chicks infected with coccidia usually die near fledging. This disease has been the main killer of young chicks since the captive programme begun.



Two juvenile males were released back into the wild in 1998 and another two in 1999.

To guard against mites and faecal build up in the nest, the nest-box is replaced when the nest becomes soiled, which also provides an opportunity to weigh and dose the chicks when required. The chicks become used to human contact and therefore are quite tame and inquisitive when they become

adult, making management (catching and moving between aviaries) and public viewing easier. Inside the clean nest-box, the chicks are placed in an artificial nest, consisting of a sieve (with the handle removed), lined with polar fleece fabric and placed inside a raised wooden platform in the nest-box. The first time the natural nest is replaced, the female typically appears confused on re-entering the box and hesitates at the entrance until eventually the calls of the hungry chicks lure her in and she readily accepts the nest changes from then on.

The chicks fledge at 28 days and are fed by their parents for a further one to two weeks. They learn to use the feeding stations after about a week and can be separated from their parents at about 40 days. Daily faecal sampling of each youngster continues (when possible) until it is three months old. We assume that by this age they have acquired resistance to coccidia, which rarely kills adult birds. Sampling is then conducted twice weekly until their faeces are consistently clear of coccidia. Throughout the winter birds of all ages are screened monthly. The past two breeding seasons have, in terms of the juvenile survival rate, been the most successful to date. Four chicks fledged in the 1997-1998 breeding season and five in the 1998-1999 season. Of these, the females have been retained for captive breeding and four males have been released on Tirititi Matangi Island in the Hauraki Gulf. We have recently learnt that one of these males has fathered a clutch in the wild there.

Correspondence concerning the above article should be addressed to Glen Holland, Species Management, Mt Bruce Field Centre, National Wildlife Centre R.D.l, Mt Bruce, Masterton, New Zealand. Tel:06-375 8004/ Fax:06-375 8003/E-mail:wildlife@winz.co.nz.

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RODOLPHE D'ERLANGER

Rosemary Low write, 'It is with sadness and regret that I have to report the death of our member Rodolphe d'Erlanger on December 23rd, after losing his fight against cancer.

d'Erlanger was perhaps primarily known for commissioning and financing the fine art works of Elizabeth Butterworth. This culminated in 1996 with the portfolio on macaws which was ten years in the making and which was described as one of the most ambitious and complex fine art works of the 20th century. Rodolphe had kept a small number of parrots for more than 20 years and consistently bred Hawk-heads throughout this period. I will sadly miss his quirky phone calls updating me on the progress of his breeding pairs. Condolences are extended to his widow and two sons.'

THE RUFOUS-CAPPED AND OTHER BABBLERS

by Frank Woolham

Many familiar and widely-kept Old World softbills are included among more than 250 members of the Timaliinae (Babblers). Species vary considerably in size and colour and among them are many long-standing avicultural favourites such as laughing thrushes *Garrulax* spp., Pekin Robin *Leiothrix lutea*, scimitar babblers *Pomatorhinus* spp., fulvettas *Alcippe* spp., yuhinas *Yuhina* spp. and tree babblers *Stachyris* spp.

The last is a genus of some 25 species which range widely over the Oriental Region. Importation of all species has been fairly spasmodic and, in aviculture, they are by no means the best known members of the family. I have had experience with only two - the Golden Babbler *Stachyris chrysaea* and, more recently, the Rufous-capped (or Red-headed) Babbler *S. ruficeps*. Both species have a range which extends from the eastern Himalayas to Burma, parts of China and Thailand. Two subspecies of the Golden Babbler are found further south - *S. chrysaea chrysops* (Malaysia) and *S. c. frigida* (western Sumatra). These are two of the smaller members of the family and examples of the Rufous-capped Babbler have been imported into Europe within recent months. I suspect two birds in my possession at present may be of Chinese origin since so many south-east Asian species have been imported into Europe from that country in recent years; certainly they fit the description of the subspecies *S. r. davidi*, one of three described from China and Hainan.

At around 4½in (11.5cm) in length, Rufous-capped Babblers are roughly similar in size and shape to species such as the Black-chinned Yuhina *Yuhina nigrimenta*. The upper surfaces including the back, wings and tail, are pale olive brown, while the crown is bright rufous-brown. The particular birds in question have uniformly grey-white underparts, paler on the chin and throat. The bill is very dark grey and the legs and feet are ochreous grey. The sexes are similar and at present I have no idea whether my two birds are a pair, although levels of compatibility give faint cause for hope!

Their slender, straight, pointed bills are similar to those of leaf warblers but in habit the birds are reminiscent of tits. They are vivacious, active and alert - almost constantly on the move, investigating and re-investigating every nook and cranny of their flight. They are remarkably confident and frequently subject their owner to close eyeball-to-eyeball scrutiny in expectation of a waxworm or some other small delicacy. Occasionally they retire to a favourite perch, where they sit side by side and on some occasions one bird partly covers the other with an outstretched wing. Despite this close association allopreening has not been observed.

I have yet to hear any song but calls are frequent and consist of a two (occasionally three) syllable churring trill. This sometimes takes on a more irritated, querulous tone. Alarm calls consist of a series of short, and rapidly repeated, staccato notes, not dissimilar (but lower in volume) to those of the Pekin Robin. Unsurprisingly for birds with such an obviously inquisitive nature, they miss little and intruders ranging from cats to Sparrowhawks *Accipiter nisus* are unerringly identified, via a window and frequently while some considerable distance away.

In the wild, members of the genus are said to be mainly insect feeders and this is certainly borne out by the dietary preferences of my birds. Their main food is Claus Fat Food Type 4 (Blue Label) to which is added small amounts of chopped (=mashed) hard-boiled egg, grated dried cheese, whole prawn and corned beef - the latter two items grated from frozen. Although clearly insectivorous they quickly started to take a few fresh (frozen) elderberries and small amounts of finely chopped sweet apple each day. Perhaps surprisingly they also enjoy a few strands of cress. Livefood, which is much enjoyed, consists of about 20 mini-mealworms fed twice a day, morning and evening, and up to eight waxworms offered at intervals throughout the day (shared between both birds). They solicit livefood from their owner with an engaging confidence that is hard to resist - but must be in the interests of their health.

In the wild they are said to inhabit scrub jungle, bamboo thickets and undergrowth, often in higher zones up to nearly 3,000m (almost 10,000ft). In general, members of the genus *Stachyris* are gregarious and outside the breeding season the Rufous-capped Babbler may be seen in travelling groups, sometimes of up to 50 or more birds, which include a number of related and similar-size species. According to Smythies in *The Birds of Burma* (Oliver & Boyd, 1953), the Rufous-capped Babbler's nest, which is mainly sited fairly low down among vegetation, is '...a rather neat-egg-shaped structure with the entrance at the top, and is made of bamboo leaves, roots and fibres, with a lining of rootlets'. Clutches usually consists of four white eggs with darker markings.

The Rufous-capped Babbler is one of several related species which seem never to have quite found a secure niche in aviculture. With few exceptions, most of the *Stachyris* spp. appear to fit Smythies' observation that they are '...small brown birds', although he also notes that the plumage of some members of the genus is often 'elegant'.

LETTERS TO THE EDITOR

IS THE GREEN AVADAVAT BEING TRAPPED TO EXTINCTION?

Thirty years ago the Green Avadavat *Amandava formosa* was a popular aviary bird due to its beautiful plumage, and was imported fairly frequently. However, it proved difficult to breed. Today it is very rare in aviculture in Europe although still trapped for trade. Sadly, it is now a declining and vulnerable species due to trapping, and as a result of habitat destruction and disturbance. For this reason it was placed on Appendix II of CITES at the 1997 CITES Conference.

The Green Avadavat is endemic to central India. It is found in areas of scrub or where there is tall grass, on the plains and in the foothills. In Pakistan there was a small population in Lahore which may have originated from escaped cage birds.

The Green Avadavat is listed on the schedule of the Indian Wildlife Protection Act of 1972 which prohibits hunting and trapping. Obviously the Act is not effective. In 1991 India instigated a total ban on keeping native birds which apparently is not implemented. The Green Avadavat is still sought after by Indian people and, probably still reaches some countries which are not signatories to CITES.

While trying to estimate the population size, Abrar Ahmed from WorldWide Fund for Nature, India, went to a certain area which he searched with trappers, as only they knew where to find these avadavats. They located a small population of between 60 and 70 birds, on stony, waste land less than lkm square (approx. 5/8 mile square). It took the trappers less than two days to wipe out this population. (Surely, a not unpredictable event.)

The Green Avadavat is further threatened by the use of pesticides and the conversion of its habitat into agricultural land. Although the Red Avadavat *A. amandava* has adapted to living in crop fields and sugar cane plantations, it is thought to be unlikely that this will a apply to the Green Avadavat.

Unless this species is better protected and illegal trapping ceases, it is in danger of extinction. Its populations are already severely fragmented.

Rosemary Low, P.O. Box 100, Mansfield, Notts NG20 9NZ.

REQUEST FOR INFORMATION

Dr Colin Harrison and I are currently updating and enlarging the Collins *Field Guide to Bird Nests, Eggs and Nestlings of Britain and Europe with North Africa and The Middle East.* We are including an additional 120 species (mainly those from the Arabian Peninsula, Afghanistan and further

to the east in Asia) and are including more detailed descriptions of young birds, particularly colours of bills, legs and feet.

We have been unable to find adequate descriptions for certain chicks as follows:

Philby's Partridge	*Alectoris philbyi*
Arabian Partridge	*Alectoris melanocephala*
Grey Francolin	*Francolinus pondicerianus*
Arabian Bustard	*Ardeotis arabs*
Hill Pigeon or Eastern Rock Dove	*Columba rupestris*
Evermann's Dove or Pale-backed Pigeon	*Columba eversmanni*
Bruce's Green Pigeon	*Treron waalia*
White-throated Bee-eater	*Merops albicollis*
Abyssinian Roller	*Coracias abyssinicus*
Indian Roller	*Coracias benghalensis*
Gambaga Dusky Flycatcher	*Muscicapa gambagae*
Turkestan Tit	*Parus bokharensis*
Yellow-breasted Tit	*Parus flavipectus*
Shining Sunbird	*Nectarinia habessinica*
White-breasted White-eye	*Zosterops abyssinica*
Large-billed Crow or Jungle Crow	*Corvus macrorhynchos*
Amethyst Starling	*Cinnyricinclus leucogaster*
Bank Myna	*Acridotheres ginginianus*
Sind Jungle Sparrow	*Passer pyrrhonota*
Arabian Golden Sparrow	*Passer euchloris*
Sudan Golden Sparrow	*Passer luteus*
Arabian Waxbill	*Estrilda rufibarba*
Arabian Serin	*Serinus rothchildi*
Yemen Serin	*Serinus menachensis*
Golden-winged Grosbeak	*Rhyncostruthus socotranus*
Yemen Linnet	*Carduelis yemenensis*

For certain species, we need details of legs, feet and bill colours only -

Siberian Crane	*Grus leucogeranus*
Reeves' Pheasant	*Syrmaticus reevesi*
Silver Pheasant	*Lophura nycthemera*
Californian Quail	*Lophortyx californicus*

If you can suggest any sources where, details of any of these might be found, I shall be most grateful.

Peter Castell, Fairlawn, 679 Chester Road, Great Sutton, Ellesmere Port CH66 2LN, England. Tel: (Home) 0151-347-1302Tel/Fax: (Office) 0151-347-1435/E-mail: PCASTELL@FSBDIAL.CO.UK

AN ALEXANDRINE PARRAKEET AND BROLGAS

In the third issue of the *Avicultural Magazine* for 1998 (Vol. 104 No. 3, p. 116), I made reference to an Alexandrine Parrakeet *Psittacula eupatria* leading a feral existence here in Dorchester. This bird subsequently featured in the UK weekly journal *Cage & Aviary Birds* in the early part of 1999, after having been retrieved from a house in Weymouth, into which it had flown through an open window. The parrakeet was handed over to the RSPCA (Royal Society for the Protection of Animals), which refused to return it to the couple who had fed it for many months at their bird table, and instead re-homed it to an aviary. The reason given for this being that it could not, as an exotic species, be returned to a free-flying existence.

The following issue of the magazine (Vol. 104, No. 4) included a reference (p. 167) to Brolgas *Grus rubicuna* at Vogelpark Walsrode, with the comment that this species does not appear to have been bred in Europe. Rutgers and Norris (1970) quoted from an article in the *Avicultural Magazine* by Hubert Astley in 1924, describing the young Brolga (Australian Crane) hatched by his pair, which seems to have been fully reared. Unfortunately, I do not have access to the primary source. Delacour (1931) confirmed that it '...has been bred in confinement'.

References

Delacour, J. et al. 1931. *Aviculture*. The Avicultural Society.
Norris, K.A. and Rutgers, A. 1970. *Encyclopedia of Aviculture*. Blandford Press, Dorset.

Philip Schofield, Dorchester, Dorset DT1 1QE, England.

According to First Breeding Records for Birds Reared to Independence under Controlled Conditions in the UK compiled by Dave Coles, the first breeding in the UK was at Woburn Park in 1908. He gives as his source the Avicultural Magazine (p. 306) for that year. In News & Views recently (Vol. 105, No. 2, p. 94), there was reference to one having hatched at Whipsnade Wild Animal Park, following the use of artificial insemination. According to the Zoological Society of London Annual Report for 1998: 'This pair had bred only twice previously in the last 20 years or so.' - Ed.

INBREEDING AND REDUCTIONS IN EGG SIZE

Since 1972 I have been assembling a reference collection of eggs laid in captivity. Here I should emphasise that I disagree with taking eggs from the wild and all of my material has been received from reputable collections after it has proved to be unviable. Through the help and generosity of a

great many aviculturists and zoo staff my collection now consists of almost 60,000 eggs representing over 2,000 species and subspecies. Since this programme has been conducted now for almost 30 years a number of trends are becoming apparent.

Two Orders, the Anseriformes and Galliformes, are widely kept and bred in captivity and many of the species tend to lay large clutches. My collection now contains large series of eggs from many of these species and since they have been acquired over a long period they represent several generations. Since many of the species of waterfowl and pheasants we have in our collections descend from a few prolific pairs these populations have, by now, become very inbred. Over the years, it had gradually become apparent that inbreeding tends to reduce egg size. However, the reduction in egg size does not necessarily adversely affect hatchability or chick viability. Of course, some highly inbred populations do loose fertility and any chicks hatched may be weak and difficult to rear, but this is not invariably the case.

Since Michel Klat has imported stock which is only one or two generations away from wild caught birds it has been possible to compare egg samples which confirms the trend of inbreeding reducing egg size. For instance Golden *Chrysolophus pictus* and Elliot's Pheasant *Syrmaticus ellioti* have been bred in captivity for many years without the infusion of new blood. Although the stock has remained viable and breeding results are still quite good the average egg size has reduced dramatically. The size of the eggs laid by the new stock imported by Mr Klat is noticeably larger. This is exactly what I have noticed with other species of pheasants, ducks and geese.

Gordon Holmes, who used to maintain a marvellous collection at Bradwell in Essex, had a large flock of Bar-headed Geese *Anser indicus* which were all colour ringed and had their parentage, as far as it was known, recorded. After it became apparent that there was an enormous difference in the size of the eggs laid by his birds we checked the records of the birds which had laid and a pattern emerged. Admittedly eggs can vary in size for a number of reasons. Young females will often lay small eggs and some clutches will include one or more abnormally small eggs. However, the overwhelming majority of the small eggs were laid by inbred stock.

We then monitored the subsequent progress of the eggs and found that the hatchability of the small eggs was very much the same as for the larger ones. Also, whilst there was a difference in the size and weight of the chicks immediately after hatching, the goslings from the small eggs quickly caught up and, by the time they started to feather, there was no discernible difference in size between those from the large or small eggs.

Have any other members got first-hand experience which supports or disproves this observation?

Bernard Sayers, Chelmsford, Essex CM2 6AB, England.

COUNCIL MEETING

A Council Meeting was held on Sunday, 19th September 1999 at Wem, Shropshire.

The following members were present: K.W. Dolton, R.C.J. Sawyer (Vice Presidents), K.J. Lawrence (Chairman), Mrs. L. Gardner, N. Hewston, S. Pyper, J. Trollope, Dr R. Wilkinson.

Minutes of the Council Meeting held on 17th April 1999 were, after minor correction, approved.

It was decided that the D.H.S. Risdon Award for the best article in the magazine during the previous year should go to Martina Müller and Norbert Neumann for the article Keeping and Breeding Fig Parrots of the Genus *Psittaculirostris* at Vogelpark Walsrode, Germany (*Avicultural Magazine* 104, 2: 55-60).

Leeds Castle was awarded the Society's Certificate of Merit for the first breeding of the Crowned Hornbill *Tockus alboterminatus* in Great Britain and Ireland. The decision whether or not to make an award to Birdworld for the first breeding of the Southern Helmeted Curassow *Pauxi u. unicornis* was deferred for further investigation.

J. Trollope was re-elected to the Council for a further five year term.

The Council was told that a stand had been booked for the National Exhibition of Cage and Aviary Birds to be held, 11th-12th December 1999, at Telford (a new venue). Mike Curzon was to be stand coordinator. The Council agreed, subject to finalising some points, to support Avian 2000.

Laura Gardner asked what had happened regarding the suggestion that the Society have a website? This had been suggested by the Hon. Editor at the previous meeting, and while the Council was (and remains) generally in favour of the idea, members felt they lack the necessary expertise to set this up. Since the previous meeting, some enquiries had been made, but to date had come to nothing and the search was continuing for someone, a member of the Society perhaps, with the necessary skills to design and maintain a successful website.

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BOOK REVIEWS

HANDBOOK OF THE BIRDS OF THE WORLD

The recently published fifth volume of the *Handbook of the Birds of the World* is simply stunning. Any doubts that it would be impossible to maintain the high standards achieved with the much acclaimed first volume in 1992 have receded further into the distance with the appearance of the four that have followed. Volume 5 easily maintains what is now a well established standard of excellence. Just three Orders, covering 10 families, occupy most of the book's 760 pages: Strigiformes (Barn Owls and typical Owls), Caprimulgiformes (Oilbird, Owlet-Nightjars, Frogmouths, Potoos and Nightjars) and Apodiformes (Swifts, Treeswifts and Hummingbirds). The format remains the same: a lengthy introduction to each family which provides considerable details under the headings Systematics, Morphological Aspects, Habitat, General Habits, Voice, Food and Feeding, Breeding, Movements, Relationship with Man, Status and Conservation.

Page size is 310 x 240mm and more than 750 distribution maps are provided adjacent to information about individual species. Use of colour is best described a lavish, even by modern day standards. There are 76 full-page plates and more than 400 colour photographs, many of outstanding merit. Completing details of the book's vital statistics, there are approximately 8,000 bibliographical references. Not least of many important contributions is a thought-provoking introductory essay from Dr N.J. Collar.

Some of the information contained in this volume is so recent its inclusion is remarkable, bearing in mind the length of time which must be taken-up from design to publishing. The Forest Owlet *Athene blewitti*, provides a good example. Rediscovered as recently as November 1997, it is not only fully described in Volume 5 but an excellent colour photograph of an example in the wild (Maharashtra, India) is also reproduced.

As a means of identifying individual species and distinctive subspecies, the colour plates are of a high standard and although styles vary (19 artists contributed to the volume) quality is consistent. No fewer than 32 of the 76 plates are devoted to hummingbirds with all of the generally recognised 328 species (plus many subspecies) illustrated. There are also 125 outstanding colour photographs of these iridescent New World gems. And while the majority of species appear to have been photographed in their natural environment, I was particularly taken by a shot of a Bee Hummingbird *Mellisuga helenae* perched on the unsharpened end of a pencil to illustrate its tiny size.

Photographs of a number of interesting conservation-sensitive species are also included. Worthy of note are the Blossomcrown *Eriocnemis derbyi*,

Juan Fernandez Firecrown *Sephanoides fernandensis*, Chilean Woodstar *Myrtis yarrellii* and Hooded Visorbearer *Augastes lumachella*.

While aviculturists will be particularly interested in the comprehensive treatment given to the hummingbirds, coverage of the barn owls and typical owls is also extensive and is accompanied by some outstanding photographs. I do not claim to be an owl expert (in fact I shy away from that over-used word in relation to every subject with which I am reasonably familiar) but I was impressed by several photographs here, including one of a Congo Bay Owl *Phodilus prigoginei*, which apparently vanished after its discovery in 1951 to reappear again 45 years later. Photographs of other species which also took my eye include relatively 'new' species' including the Long-whiskered Owlet *Xenoglaux loweryi* from northern Peru, Cloudforest Pygmy Owl *Glaucidium nubicola* from the Pacific slope of the Andes, and the Sangihe Scops Owl *Otus collari* from Sangihe Island. A taxonomic challenge is highlighted on facing pages by photographs of 12 species and subspecies of the genus *Otus*. There are many more examples of the wildlife photographer's art with most subjects pictured while involved in some kind of behavioural activity.

One of my favourites among the typical owls is Woodford's now probably better known as the African Wood Owl. My relatively meagre knowledge of the Strigidae was given something of a lift when I discovered (p 204) that what I had always known as *Ciccaba woodfordii* has been reclassified *Strix woodfordii*. DNA studies have shown that the previous generic separation was not justified.

The first five volumes have already added immeasurably to our knowledge of the world's birds. The books will undoubtedly appreciate in value and are worthy of acquisition for aesthetic reasons alone. My niece, a County Archivist, spotted Volume 5 when she visited us recently and spent half a day going through it page by page before delivering an opinion: 'This is going to be a much sought-after collectable in the next century', was her view. But few people will leave this or any of its predecessors to gather dust on a bookshelf. So informative a work demands regular use!

Like earlier volumes it is edited by J. del Hoyo, A. Elliot and J. Gargatal and published by Lynx Edicions, Passeig de Gracia 12, 08007 Barcelona, Spain. Tel: 34-93 301 0777/Fax: 34 93 302 1475/E-mail:lynx@hbw.com/ Internet:http.//www.hbw.com

Frank Woolham

AUSTRALIAN WHITE COCKATOOS

The 15th title in the highly successful Australian Birdkeeper *A Guide to...* series, covers the *Australian White Cockatoos*. The term 'white' is used to mean non-black, thus Galahs and Gang Gangs are included, in addition to the *Cacatua* species. The author is Chris Hunt from Victoria who, with his wife Maree, breeds cockatoos, some of which are hand-reared for the pet trade.

This is a very practical guide, starting off with advice on purchasing cockatoos, transportation and the quarantine of new arrivals. The correct way to handle a cockatoo, with and without a towel, is illustrated with photographs. Housing, rodent control and aviary design are discussed, along with the fact that suspended cages are not suitable for most cockatoos because they like to forage and play on the aviary floor. This section includes a photograph of an upright cylindrical outdoor cage for a pet cockatoo. Sadly, I have seen these cages used on many occasions in Australia, although they are totally unsuitable as the cockatoo is hardly able to open its wings. There is much good advice on size and gauge of wire mesh.

The section on nutrition is very well illustrated and the need for fresh cut branches is emphasised. Australians, of course, are able to supply a wealth of natural foods such as branches with eucalyptus gum nuts. In Europe we have to make do with pine cones.

The section on hand-rearing includes a useful table of weights of chicks being hand-reared, from the ages of 15 day to weaning. To wean Greater Sulphur-crests at 54 days seems rather early, to me, likewise Long-billed Corellas at seven weeks. But then in my opinion most hand-feeders wean cockatoos much too early, often with lasting psychological damage. The husbandry section covers 41 pages. It is followed by a 19 page section on diseases by Stacey Gelis, BVSc, MACVSc, an avian vet and aviculturist. This is a very valuable section, especially that describing what to do with a sick bird, and the problems caused by dietary deficiencies. Discussion on the diseases to which cockatoos are most susceptible, such as PBFD (circovirus), polyoma and chlamydiosis, includes disinfection, treatment and supportive care. Bacterial infections, aspergillosis, candidiasis, bumblefoot, worms, parasites and heavy metal poisoning are all covered in a lucid and readable manner. The various causes of feather plucking are also detailed, including allergies (dust-mites, grasses etc.).

The following 40 pages are devoted to species descriptions, with notes for each one on breeding, sexing, mutations, etc. For the Galah there are tables showing expectations from pairing together the various mutations. This book is profusely illustrated and contains a wealth of useful information. It is essential reading for all keepers and breeders of cockatoos, Australian or otherwise.

Rosemary Low

NEWS & VIEWS

ARMED RAID

It was reported (*Cage & Aviary Birds*, February 5th issue) that 60 Bali Starlings *Leucopsar rothschildi* were taken in an armed raid on the captive breeding centre on the Indonesian island of Bali. Later, the number stolen was amended to 'some 39', with the other 21 seemingly unaccounted for! Some of the stolen birds were already said to be turning up on the black market out there. Members will recall that John Horton recently wrote about his visit to the captive breeding centre (*Avicultural Magazine* 105, 2: 54-56) and how, at the time of his visit in June 1999, there were said to be 81 Bali Starlings (breeding pairs and their young) housed there.

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TOUCAN REARED

Geoff Masson, Head Keeper at Paultons Park has provided the following details about the breeding of a Toco Toucan *Ramphastos toco* there last year: 'Eggs have been laid by our pair of Toco Toucans for a number of years but no chicks had been reared successfully. Things seemed to be going the same way last year when the chicks from the first two clutches, totalling six eggs, were dead in the shell again. When a third clutch of two eggs was laid I decided to leave them with the parents. The problem with this course of action was that the parents always remove all the nest lining and lay the eggs directly onto the wooden floor of the box. The birds were allowed to sit as they were for two to three days and then when the female came out of the nest-box to feed, I nipped into the aviary and put about 3in (7.5cm) of sand in the bottom of the box and replaced the eggs. The female went straight back and resumed incubation.

Approximately one week before the two eggs were due to hatch a third egg was laid. A few days later this disappeared and one of the original eggs was found broken on the floor with a fully formed chick dead inside. The remaining egg was removed to an incubator. It hatched June 20th and the chick weighed 21g. It was fed by syringe and kept in a brooder until its eyes started to open on the seventeenth day. It was then transferred to a heated unit with one-way glass and fed using a Toco Toucan puppet obtained from our gift shop. The toucan was weaned on October 18th. DNA sexing established it is a female, and a male has been purchased to pair up with her this spring.

Geoff is interested in making contact with anyone with single Toco Toucans, or incompatible birds, with the view to exchanging these for captive bred birds. He can be contacted at:- Paultons Park, Ower, Romsey, Hants. SO51 6AL. Tel: 01703 814442.

JAVA SPARROW AMONG BIRDS UNDER THREAT

The Java Sparrow *Padda oryzivora* is on the surface perhaps a surprise inclusion in a list of over 1,200 bird species considered to be threatened by extinction. Other species on the list, published recently by BirdLife International, include the Gouldian Finch *Chloebia gouldiae*, Star Finch *Neochima ruficauda*, Royal Parrot Finch *Erythrura regia*, Green Avadavat *Amandava formosa*, Bali Starling *Leucopsar rothschildi* and Blue Bird of Paradise *Paradisaea rudolphi.* Also on the list are 17 species of Amazon parrots *Amazona* spp., several macaws *Anodorhynchus*, *Cyanopsitta* and *Ara* spp., and many other parrots, as well as pigeons, ducks, geese and pheasants. All 1,200 and more species will be included in *Threatened Birds of the World*, to be published by BirdLife International and for which it hopes to find a sponsor for each species. If you would like to know more, you can contact Naomi Hawkins, BirdLife International, Wellbrook Court, Girton Road, Cambridge CB3 0NA, UK. Tel:+44 1223 277318/Fax:+44 1223 277200/E-mail:naomi.hawkins@birdlife.org.uk

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AUSTRALIANS STUNG BY CRITICISM

J.R. (Bob) Hodges' criticism of the Orange-bellied Parrot Recovery Plan contained in his article Saving the Orange-bellied Parrakeet (*Avicultural Magazine* 104, 2: 49-52), which brought a response from Richard H. Loyn on behalf of the Orange-bellied Parrot Recovery Team (*Avicultural Magazine* 105, 3: 134-136), was also commented upon in the Newsletter of the South Australian Ornithologist Association.

Bob had, wrote the author quoted in *Eclectus*, criticised the team because it has not been 'prepared to distribute potential breeding birds to reputable aviculturists nor even take advantage of their knowledge and expertise'. They had been, the author continued: 'trapped for aviculture for more than 120 years; a literature search and other sources of recorded information showed that a minimum of 70 individuals were trapped in South Australia alone between 1934 and the early 1970s; and according to one authority one South Australian aviculturalist had 'never been without these birds which he traps himself, since 1934' (*Australian Parrots in Captivity* Lendon, A. H. 1951). The second criticism also overlooks the fact that one member of the Recovery Team [Peter Brown] was once a member of the Council of the Avicultural Society. Personally I believe the Team's reluctance to distribute Orange-bellied Parrots to aviculturalists, no matter how reputable, is that experience has shown that widespread establishment as a cage bird often leads both to pleas for more wild stock for 'new blood' and to a minority of aviculturalists who are careless about such matters, acquiring birds of doubtful origin.'

NESTING AMAZON AND NEW OWL

The Wilson Bulletin Vol. 111 No. 4, December 1999, includes (pp. 488-493) an account of the nesting behaviour of the Lilac-crowned Amazon *Amazona finschi*, observed over a three year period at 24 nests in the dry forest of the Chamela-Cuixmala Biosphere Reserve, western Mexico. There is also (pp. 457-464) a description and painting of a new species of owl, the Cinnabar Hawk-Owl *Ninox ios*, from north Sulawesi. Described from a specimen collected in 1985 in forest in Bogani Nani Wartabone (then Dumoga-Bone) National Park, it was previously identified as a rufous morph of the Ochre-bellied Hawk-Owl *N. ochracea*.

* * *

A BUSY YEAR FOR THE WCS

The New York *Wildlife Conservation Society Annual Report 1999* notes that during the year Ornithology Department Chairman and Curator Donald Bruning continued to work with Taman Safari and Taman Mini Bird Park in Indonesia, which resulted in the latter being the first Indonesian establishment to breed the Maleo *Macrocephalon maleo*. Senior Keeper Patti Cooper worked with keepers at Jurong Bird Park, Singapore, on management protocols for birds of paradise, as well as visiting Taman Safari to assist with its bird of paradise programme.

Assistant Collection Manager Marcia Arland visited Entebbe Zoo, Uganda, to review its facilities for Pied Kingfishers *Ceryle rudis*. Pairs usually lose one or two young per clutch, so the department will collect nestlings that otherwise might starve, hand-rear them in Uganda, and take the adults back to the Bronx Zoo. The Ornithology Department has three pairs of Bulwer's Wattled Pheasants *Lophura bulweri* but, to date, the captive breeding programme has been unsuccessful. In relation to this, Assistant Curator John Rowden travelled to Borneo to observe this species in the wild, and hopes to establish a long-term conservation project there for Bulwer's Wattled Pheasant. During the year the department received two pairs of Green Junglefowl *Gallus varius* which are unrelated to any other birds of this species in collections in the USA.

Bronx Zoo's first Lesser Adjutant Stork *Leptoptilos javanicus* chick was successfully reared by its parents in 1999. Montezuma Oropendula *Psarocolius montezuma*, Congo Peafowl *Afropavo congensis* and Fairy Bluebird *Irena puella* were some of the other notable species bred there last year.

Information about current WCS activities can be found on its web page at www.wcs.org. The home page which is changed weekly has the latest news items, including about scientific projects, special zoo events and conservation work.

REARED BY CANARIES

Eric Callaghan, of Dublin, Ireland, who was awarded the Society's medal for the first breeding of the Three-banded Rosefinch *Carpodacus trifasciatus*, wrote at the end of last year and mentioned he had bred two Dark Rosefinches *C. nipalensis*, which had been fostered under canaries. He also had a Pallas's Rosefinch *C. roseus* reared by canaries and was disappointed to have lost two broods of Great Eastern Rosefinches *C. rubicilloides* at a few days old, because he had no suitable foster parents available at the time. As hard as he has tried, Eric has been unable to persuade any of his species of rosefinches to accept any form of livefood, and is sure it is a major reason for his difficulty in producing parent-reared young. He was surprised therefore that when Frank Meaden bred the Three-banded species last year, his birds took waxmoth larvae.

* * *

VETS AT THE NATIONAL AGAIN

Once again veterinary surgeons participated at the UK's largest bird show, the National Exhibition Of Cage and Aviary Birds, held December 10th-12th, at the Telford International Centre.

As in previous years, a Vets' First Aid Room, provided facilities for birds in need of treatment, rest or temporary housing. Experienced veterinary surgeons, Kevin Eatwell, MRCVS, Mark Evans, MRCVS and Richard Saunders, MRCVS, supervised the room and provided general assistance during the show. Veterinary undergraduates, Simon Priestnall, Steve Smith, Caroline Harling and Ella Poulter took turns at working with the duty veterinary surgeon and gained practical experience of handling and tending birds. Postgraduate students Becki Lawson and Kate Goldworthy of the UK, Petra Wesche from Germany and Willemien van Wyk from South Africa, all on the London-based MSc Wild Animal Health Course, assisted in the work of the exhibition's Inspection Committee and liaised with traders and others on health and welfare matters.

Students also played a part in publicising the work of IFAR (International Fund for Avian Research) which provides grants for work with free-living and captive birds and supports the attendance of postgraduate students at the exhibition. Co-ordinated by Professor John Cooper, FRCVS, the veterinary work is now an integral part of the weekend and, in addition to promoting the health and welfare of birds provides an excellent opportunity for veterinary students to meet experienced aviculturists and learn from them. Avian medicine has made enormous advances in recent years and more and more veterinary surgeons now deal with birds in their practises. Involvement in the National Exhibition, together with the work of IFAR, is helping to ensure that the standing of veterinary surgeons in this field continues to strengthen, with benefits to birds, their owners and the veterinary profession.

NEW SECRETARY OF IFAR

Emma Magnus is the new Hon. Secretary of the International Fund for Avian Research (IFAR). She has taken over from Brian Byles, the fund's founder, who remains the Hon. Treasurer. Further information about IFAR and its work can be obtained by contacting it:- c/o British Veterinary Association, 7 Mansfield Street, London W1M 0AT, or E-mail: emma@ifar.freeserve.co.uk or EmmaMagnus@compuserve.com

* * *

LATEST ARRIVALS

The latest birds to be hatched at Chester Zoo include two Bali Starlings *Leucopsar rothschildi*, a Nicobar Pigeon *Caloenas nicobarica*, two Speckled Pigeons *Columba guinea* and a Golden Heart Pigeon *Gallicolumba rufigula.* New arrivals include a Black Stork *Ciconia nigra* and two White-eared Catbirds *Ailuroedus buccoides*.

* * *

MAKING THEMSELVES AT HOME

Les Reid, a member of the Sierra Club, returned home to find a Californian Condor *Gymnogyps californianus* eating his underpants. Altogether there were eight condors on his mattress. They had entered by tearing open the screen door. They are, according to the report, among 49 captive-bred condors released into the wild, many of which appear to have no fear of humans. Elsewhere in California, residents of Merced were, it seems, trying to scare away 200 Turkey Vultures *Cathartes aura*, which were nesting in nearby eucalyptus,

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PET INDEX 2000

Pet Index 2000 (website:www.petindex.co.uk), The Pet Industry Business Opportunities Exhibition, will be held April 16th-17th, at the NEC, Birmingham.

* * *

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CONTENTS

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